

Relevance of hazard assessment and control to practical accident prevention

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This paper is valuable in distinguishing between risks and hazards. The analysis of the probability of dangerous occurrences is a necessary step which will in due course affect design philosophy and operating practice in a wide range of industry. The results will of course be most relevant in plant and processes where hazards are high.

27. While the consequences of catastrophic failure seize the public imagination it remains the case that the engineering, construction and shipbuilding industries bear significant annual burdens because of the recurring human and financial costs of accidents and accident prevention in areas of lower hazard and higher risk. Even in a year which includes a Flixborough-type disaster, these costs are likely to be several orders of magnitude greater than the annual costs of major incidents. Attention to hazard analysis and plant reliability should not therefore be allowed to obscure the importance of practical accident prevention measures in the lower hazard, higher risk areas. The latter part of the paper is in this respect altogether appropriate, and my comment is limited to this section.

28. The manufacture of iron and steel includes some significant areas of hazard, particularly those associated with blast furnace gas and the handling of hot metal. Over many years the UK steel industry has been concerned with safe working practices, and prior to 1967 comparative statistics were published to show the relative performance of the then independent operating companies. Despite the hazardous environment the great majority of accidents resulting in loss of time were attributed to quite mundane causes—stepping on or striking against objects, handling goods, and using hand tools. The importance of the problem led to the formation of safety departments well in advance of any UK statutory requirement, and in many works a chief safety officer was appointed, supported by a more or less elaborate administrative organization to oversee the publicity, training and control required in accident prevention measures as well as supervising the fire fighting and gas testing activities. The results generally have not been unsatisfactory; iron and steel making is notably less accident-prone than some other industries although, *prima facie*, it might be thought to be more dangerous.

29. In one steelworks employing more than 5000 people a rather different approach was taken, in that no safety officer was appointed, and the functions above were discharged by an accident prevention committee which included works representatives and departmental managers from all sections of the plant. This apparent recipe for disaster in fact succeeded because the monthly meetings were chaired by the company's Chief Executive, who considered the topic important enough to justify time which would otherwise be devoted to more obvious aspects of running the business. The accident

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statistics from the plant consistently showed it to be in the upper quartile for safe working in the industry, and underlined the point that there is no necessary correlation between success in accident prevention and the amount of financial and administrative resource devoted to it.

30. I believe, however, that the more important and positive inference is that any effective scheme of risk and hazard control depends very much on management leadership and management participation. Whilst accident prevention is everybody's business, only management has the authority to execute policy, and, unless there is something sadly wrong in the organization, only management can create the atmosphere in which all concerned take safety problems seriously. If management at the top level does not demonstrate an active interest in this matter, results will inevitably be less than the optimum. When such interest is lacking the effect is totally adverse both on workmen and first-line supervision and probably more so in respect of the latter—the very people whose participation is essential to the control of high-risk, low-hazard danger. Current legislation which requires the appointment of safety officers, the formation of safety committees and other measures can never be a substitute for management responsibility. Safety is too important to be left solely in the hands of safety officers, personnel managers or administrative assistants; it is a function of general management and should be so recognized.

31. Although the statements in § 21 indicate that in only a quarter of the cases examined could reasonably practicable precautions have been taken by management, I would suggest that the area of management responsibility covers a much larger fraction than the strict interpretation of § 21 implies. It could be argued that there are few industrial accidents which do not raise some question mark on management policy; it would be of interest to have the Author's comment on this.

Mr Hooper

32. It is pleasing to note that there is some support for my plea that growing interest in the sophistication of hazard analysis and plant reliability should not reduce concern and effort in low hazard but relatively high risk areas where most of the reportable injuries occur. I am aware of the leadership that the UK steel industry has demonstrated in safety matters over the years but I cannot agree that there is no necessary correlation between accident prevention and resources devoted to it. Certainly, resources can be misapplied and, sometimes, an over-application of administrative resources can be counter-productive, but although a little safety can go a long way it cannot be had on the cheap!

33. Some clarification is obviously required concerning my remarks that in only 25% of the cases examined could reasonably practicable precautions have been taken by management. The remarks were not meant to imply that nothing could have been done to prevent the accidents but merely that, on the evidence available and given the facts *at the time*, it did not appear that management could have foreseen the events so as to have taken precautions to prevent those particular accidents 'so far as was reasonably practicable'. I do agree that management responsibility extends across the full range of safety promotion and the prevention of accidents at work. It is just that others have duties and responsibilities too and, with the best will in the world, work does entail some risk and there are those accidents that, in any realistic sense, defy reasonable attempts to prevent them.